SCREENING SITE INSPECTION REPORT
FOR
IRATHANE SYSTEMS, INC.
HIBBING, MINNESOTA
U.S. EPA ID: MND022818306
SS ID: NONE
TDD: F05-8910-012
PAN: FMN0230SB

JANUARY 16, 1991

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International Specialists in the Environment

SIGNATURE PAGE
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1. INTRODUCTION

Ecology and Environment, Inc., Field Investigation Team (FIT) was tasked by the United States Environmental Protection Agency (U.S. EPA) to conduct a screening site inspection (SSI) of the Irathane Systems, Inc. (ISI), site under contract number 68-01-7347.

The site was initially discovered in 1978 by the State of Minnesota Department of Occupational Safety and Health Administration (OSHA) after a complaint was filed by a former employee of Irathane Systems, Inc. (Irathane). The employee complained of being exposed to chemicals and solvent fumes because of the absence of safety precautions at the facility (U.S. EPA 1984).

The site was evaluated in the form of a preliminary assessment (PA) that was submitted to U.S. EPA. The PA was prepared by Susan M. Cedarleaf of the Minnesota Pollution Control Agency (MPCA) and is dated June 12, 1984 (U.S. EPA 1984).

FIT prepared an SSI work plan for the ISI site under technical directive document (TDD) F05-8910-012, issued on October 12, 1989. The SSI work plan was approved by U.S. EPA on March 6, 1990. The SSI of the ISI site was conducted on April 5, 1990, under amended TDD F05-8910-012, issued on March 6, 1990.

The FIT SSI included an interview with site representatives, a reconnaissance inspection of the site, and the collection of five soil samples.

The purposes of an SSI have been stated by U.S. EPA in a directive outlining Pre-Remedial Program strategies. The directive states:

> All sites will receive a screening SI to 1) collect additional data beyond the PA to enable a more refined preliminary HRS [Hazard Ranking System] score, 2) establish priorities among sites most likely to qualify for the NPL [National Priorities List], and 3) identify the most critical data requirements for the listing SI step. A screening SI will not have rigorous data quality objectives (DQOs). Based on the refined preliminary HRS score and other technical judgement factors, the site will then either be designated as NFRAP [no further remedial action planned], or carried forward as an NPL listing candidate. A listing SI will not automatically be done on these sites, however. First, they will go through a management evaluation to determine whether they can be addressed by another authority such as RCRA [Resource Conservation and Recovery Act].... Sites that are designated NFRAP or deferred to other statutes are not candidates for a listing SI.
>
> The listing SI will address all the data requirements of the revised HRS using field screening and NPL level DQOs. It may also provide needed data in a format to support remedial investigation work plan development. Only sites that appear to score high enough for listing and that have not been deferred to another authority will receive a listing SI. (U.S. EPA 1988)

U.S. EPA Region V has also instructed FIT to identify sites during the SSI that may require removal action to remediate an immediate human health or environmental threat.

2. SITE BACKGROUND

2.1 INTRODUCTION

This section presents information obtained from SSI work plan preparation, the site representative interview, and a reconnaissance inspection of the site.

2.2 SITE DESCRIPTION

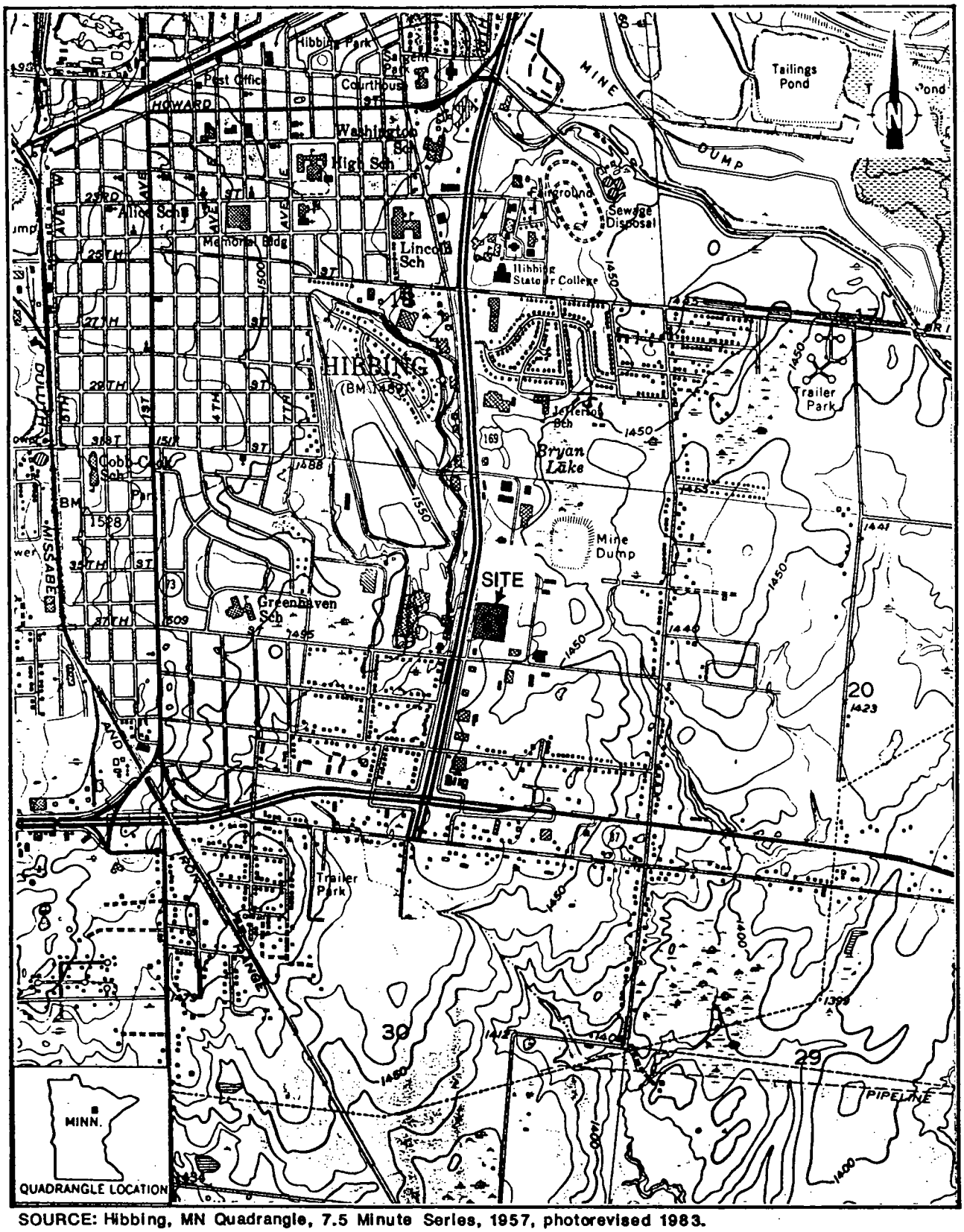
The 5-acre ISI site is located on the southeast side of the city of Hibbing, Minnesota, at 3516 13th Avenue East (NE1/4 sec. 19, T.57N., R.20W.) (see Figure 2-1 for map of site location). The site is surrounded by commercial property and light industrial facilities. Two companies are currently operating from the only on-site building--a company that produces urethane-cast mining parts for the mining industry and a rubber tire recapping business.

A 4-mile radius map of the ISI site is provided in Appendix A.

2.3 SITE HISTORY

The ISI site is currently owned by Mesaba Realty Company (Mesaba) of Hibbing. Mesaba purchased the property in October 1981 from Irathane, also of Hibbing. Irathane had owned the property since 1977. According to site representatives, ownership of the property prior to 1977 is not known (Barach 1990; Dallosto 1990).

Two companies are currently operating on-site (see Figure 2-2 for on-site operating boundaries). Irathane, which manufactures urethane-cast parts, such as gears, for the mining industry; and VBL, Inc., which recaps rubber tires used on mining equipment. Irathane has operated on-site for approximately 13 years and has been a division of Illinois



SOURCE: Hibbing, MN Quadrangle, 7.5 Minute Series, 1957, photorevised 1983.

SCALE

0 ½ 1 MILE

FIGURE 2-1 SITE LOCATION

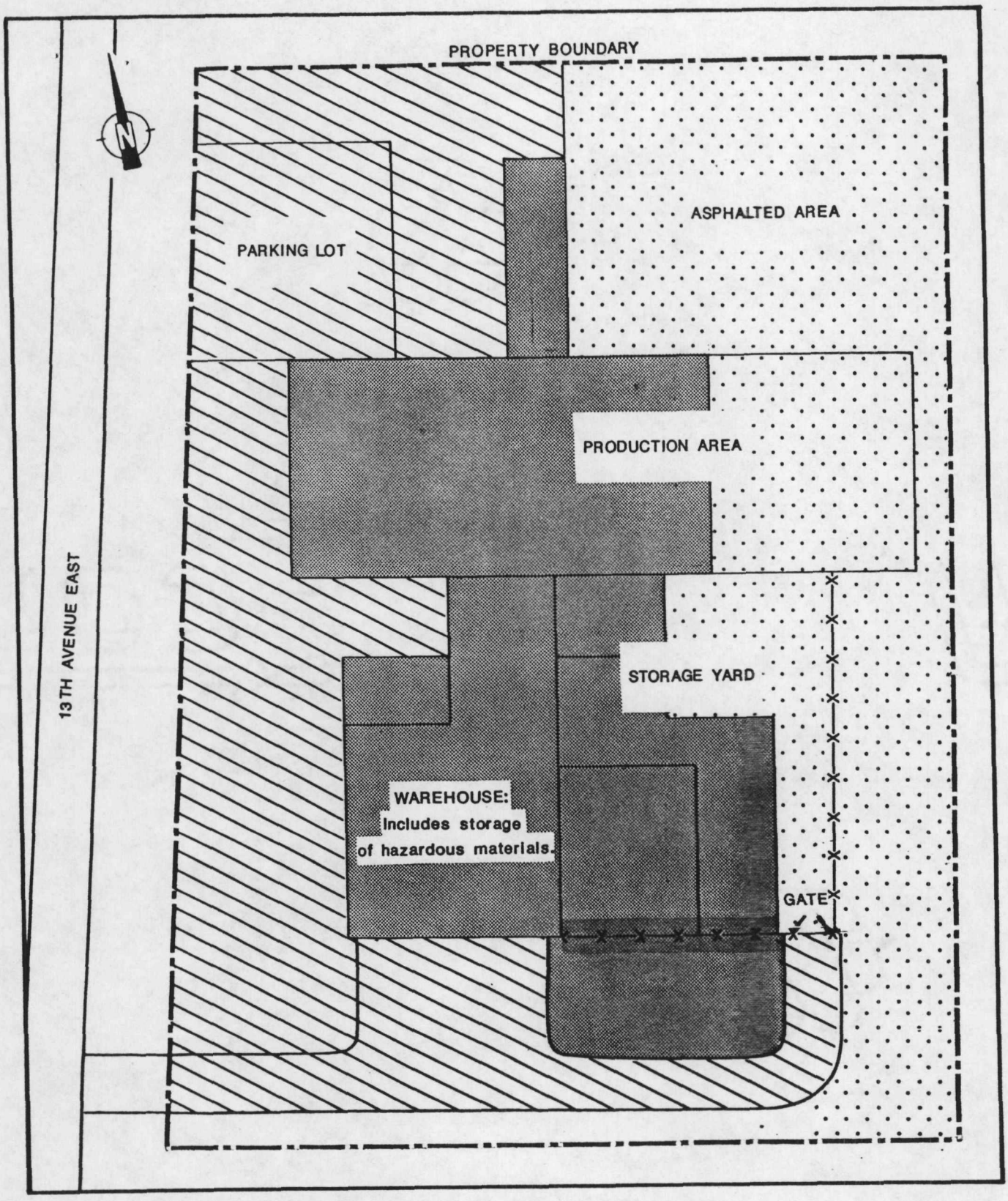


FIGURE 2-2 OPERATING BOUNDARIES

Tool Works (ITW) of Chicago, Illinois, since September 1983 (Barach 1990; Dallosto 1990). VBL, Inc., has operated on-site for approximately 10 years (Gnaedinger 1980).

The Irathane facility generates hazardous wastes during the urethane-cast process; the company is classified as a small-quantity generator under the Resource Conservation and Recovery Act (RCRA) (U.S. EPA 1984; Dallosto 1990). The general categories of raw materials used by Irathane include urethane prepolymers and polyols, primers, adhesives, plasticizers, and cleanup solvents (Barach 1990). FIT was denied the information indicating the actual compounds used at the facility (Dallosto 1990).

Irathane's manufacturing process results in two primary waste streams, a liquid and a solid (Barach 1990). The liquid stream from the coatings manufacturing process contains waste solvents; among these waste solvents are methylethyl ketone (MEK), isopropyl alcohol, toluene, and xylenes. Heavy metals are also found in this waste stream (Waste Research and Reclamation Company, Inc. 1984), which is considered to be RCRA-hazardous because of the toxicity of its individual constituents (Barach 1990). In 1989, Irathane produced approximately 1,500 pounds of this waste (Barach 1990).

The solid waste stream results from the periodic flushing of the equipment. This waste is mostly made up of urethane waste and dichloromethane, which is used to flush the equipment. EP toxicity test findings have determined this waste stream's individual constituents to be RCRA-hazardous. In 1989, the Irathane facility generated approximately 14,000 pounds of this waste (Barach 1990). Specific wastes generated there included waste oils (Worum Chemical 1989), waste paint and related materials (Wisconsin, State of 1990), waste methylene chloride (Wisconsin, State of 1987), and 4,4'-methylene-bis[2-chloraniline] (MOCA) (Gnaedinger 1980; Dallosto 1990).

Transporters currently used by Irathane to haul its hazardous waste include Safety Kleen of La Crosse, Wisconsin, for waste paint and related materials; Van Water and Rogers of Minneapolis, Minnesota for waste methylene chloride; and Worum Chemical Company of St. Paul, Minnesota, for waste oils (Barach 1990).

Currently, all of Irathane's hazardous wastes are placed in 55-gallon drums. The drums are stored in a warehouse area of the on-site building until enough drums are accumulated for transport to appropriate off-site disposal locations (Barach 1990). In the past, Irathane used both the warehouse and a storage yard, which is not diked, completely paved, or curbed, in the southeast corner of the site to store drums containing waste material (Irathane 1981; U.S. EPA 1984).

In the late 1970s and early 1980s Irathane disposed of unknown quantities of wastes generated by the company in two local landfills, *Hibbing/Kitzville Dump and Hibbing Sanitary Landfill. MPCA also alleged* that Irathane had disposed of waste solvents into the Hibbing municipal sewer system without first acquiring proper permits; however, this report was never verified and Irathane officials deny the allegations (Gnaedinger 1980; Dallosto 1990).

In 1985, MPCA denied an Irathane request to discharge three liquid resin wastes into the Hibbing municipal sewer system. The request was denied because, according to the Material Safety Data Sheets (MSDSs) for the resins, the proper disposal method is incineration (MPCA 1985).

In 1978, State of Minnesota OSHA conducted an inspection of the Irathane facility. This inspection resulted from a complaint by a former Irathane employee who stated that improper safety regulations caused his exposure to chemicals and solvent fumes (U.S. EPA 1984; Dallosto 1990). State of Minnesota OSHA found potential health and safety violations, but there are no records indicating the actual violations (U.S. EPA 1984).

In 1980, U.S. EPA received a "hot line" complaint alleging improper disposal practices at Irathane (U.S. EPA 1984). The person filing the complaint and his relationship to Irathane is not known. In April 1980, U.S. EPA and MPCA conducted a joint inspection at the facility (Gnaedinger 1980). It is not known if this inspection resulted from the "hot line" complaint.

During this inspection, several spills and leaking drums were observed inside the facility. A potential for a discharge of wastes into the Hibbing municipal sewer system was also noted. Officials of Irathane denied that materials had been discharged into the sewer system (Gnaedinger 1980). A number of waste samples were also collected inside

the facility during this inspection (Gnaedinger 1980). These samples were analyzed and found to contain MOCA, trichloroethylene, methylene chloride, and other volatile organic compounds (U.S. EPA 1984).

In June 1981, Irathane informed MPCA that the company was in the process of cleaning up its storage yard to comply with MPCA regulations for storage of hazardous wastes. Irathane officials indicated that the storage yard would be cleaned up by July 21, 1981 (Irathane 1981). FIT has no information that indicates this cleanup action was the result of any regulatory agency request; it is also not known whether any MPCA inspections took place in response to the cleanup of the site. MPCA, however, does conduct yearly RCRA compliance inspections at the facility, and no violations involving the storage yard have been reported (Dallosto 1990).

Site representatives indicated that the only spill that took place in the storage yard occurred in March 1990 and was the result of approximately 25 pounds of a possibly hazardous waste leaking from a drum (Barach 1990). This material was collected and placed into two 55-gallon drums, which were stored in the warehouse; these drums were to be transported off-site (Barach 1990).

According to federal, state, and local records, no enforcement actions have been initiated against the Irathane facility.

3. SCREENING SITE INSPECTION PROCEDURES AND FIELD OBSERVATIONS

3.1 INTRODUCTION

This section outlines procedures and observations of the SSI of the ISI site. Individual subsections address the site representative interview, reconnaissance inspection, and sampling procedures. Rationales for specific FIT activities are also provided. The SSI was conducted in accordance with the U.S. EPA-approved work plan with the following exceptions. FIT defined the site location during the SSI; because a large portion of the site was covered by asphalt, thus limiting the sampling area, only five soil samples were collected instead of the previously proposed six.

The U.S. EPA Potential Hazardous Waste Site Inspection Report (Form 2070-13) for the ISI site is provided in Appendix B.

3.2 SITE REPRESENTATIVE INTERVIEW

Ted Nehrkorn, FIT team leader, conducted an interview with representatives from Irathane and ITW. Also present were representatives of two environmental consulting firms: Environmental Science and Engineering (ESE) of Peoria, Illinois, representing ITW; and Potter and Associates (Potter) of Cook, Minnesota, representing Irathane.

Irathane was represented by Joseph D. Barach, Manager of Research and Development and Quality Assurance. ITW was represented by Philip S. Dallosto, Senior Attorney and Assistant Secretary. ESE was represented by Michael J. Hoffman, Manager of Industrial Services. Potter was represented by Laurie Potter, environmental consultant. The interview took place on April 4, 1990, at 4:00 p.m. at one of Irathane's on-site

offices. Cortney Schmidt of FIT was also present at the interview. The interview was conducted to gather information that would aid FIT in conducting SSI activities.

3.3 RECONNAISSANCE INSPECTION

On April 5, 1990, FIT conducted a reconnaissance inspection of the ISI site and surrounding area in accordance with Ecology and Environment, Inc. (E & E), health and safety guidelines. The reconnaissance inspection began at 8:40 a.m. and included a walk-through of the site to determine appropriate health and safety requirements for conducting on-site activities and to make observations to aid in characterizing the site. FIT also determined sampling locations during the reconnaissance inspection. FIT was accompanied by Barach, Dallosto, and Hoffman during the reconnaissance inspection.

Reconnaissance Inspection Observations. The ISI site is located on the southeast side of the city of Hibbing, Minnesota. The surrounding area consists of small businesses and light industry. The site is bordered on the north and east by commercial property, on the south by a small wooded area, and on the west by 13th Avenue East (see Figure 3-1 for locations of site features). The terrain of the property is relatively flat, with a slight downgradient slope to the southeast.

A single building that houses a production area and a warehouse is located in the central portion of the site. Two companies operate from this building: VBL, Inc., operates out of the north section of the building; Irathane occupies the remaining portion. An asphalt area and a parking lot are is located in the northern section of the site. A large pile of old rubber tires was observed in the northeast corner of the asphalt area. A paved access road runs south of the building from 13th Avenue East to a storage yard at the southeast corner of the building. A grass covered field is located just east of the site.

The only fence on-site borders the storage yard on its south and east sides (see Figure 3-2 for storage yard features). A locked access gate is located in the southeast corner of the storage yard. The fence does not surround the entire site; no other means to limit access to the site was visible.

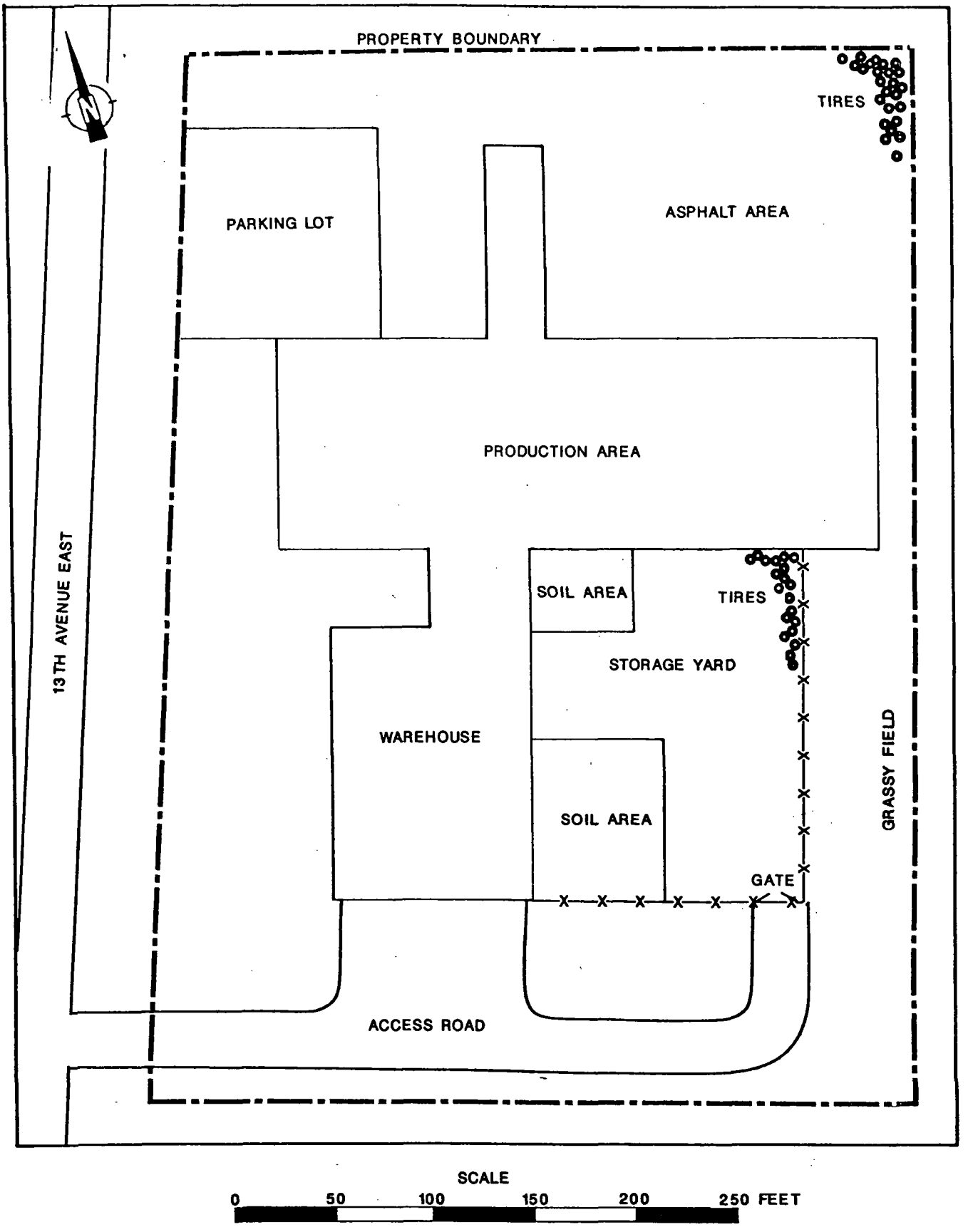


FIGURE 3-1 SITE FEATURES

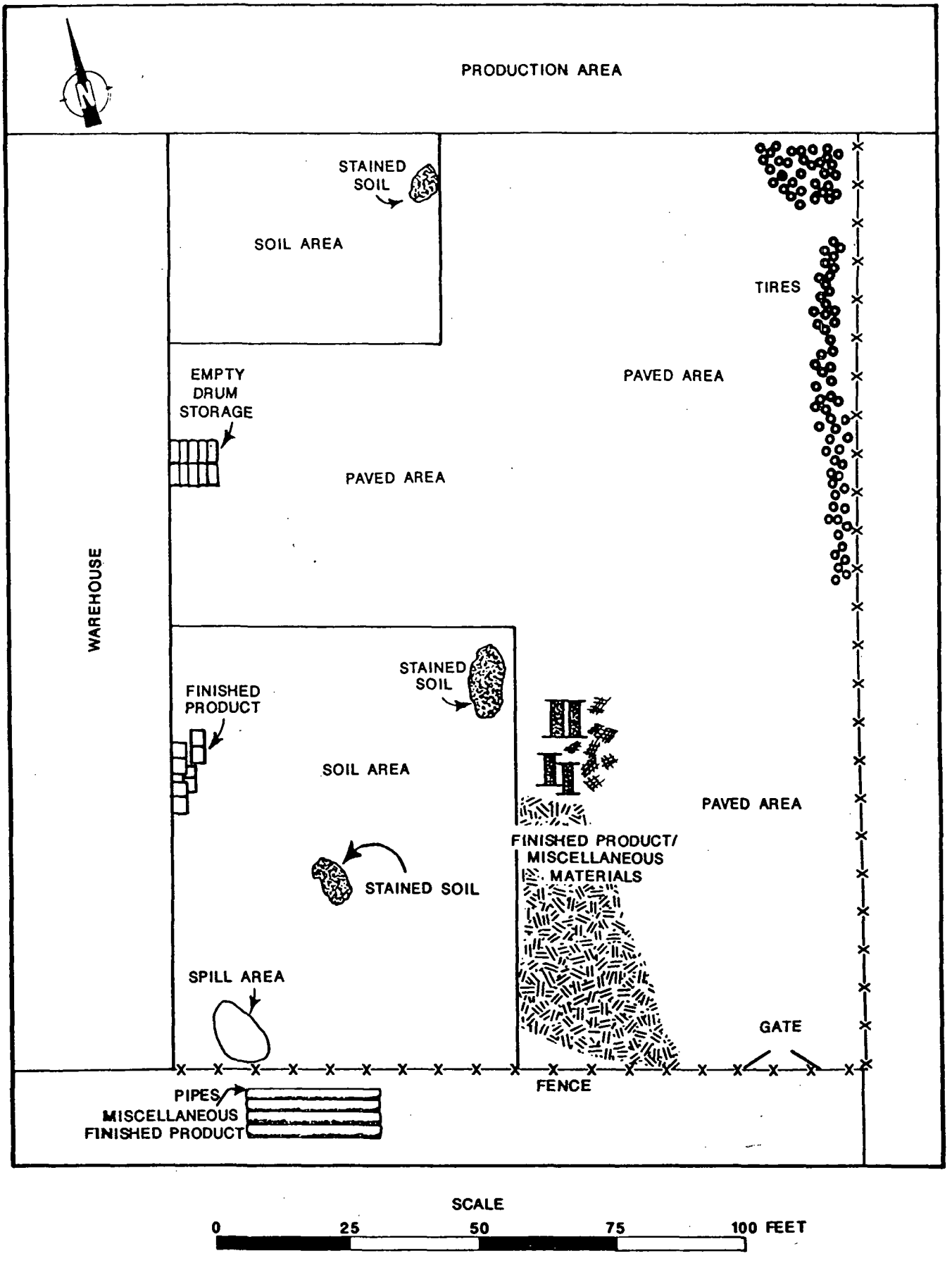


FIGURE 3-2 STORAGE YARD FEATURES

The primary area of concern for potential contamination by TCL compounds and/or TAL analytes is the storage yard. Records state that hazardous wastes were stored in this area, and at least one spill of potentially hazardous waste occurred in the storage yard (Irathane Systems, Inc. 1981; Barach 1990). Most of the storage yard was covered by asphalt except for unpaved areas in the northwest and southwest corners; these areas were covered by soil. A reddish orange material was observed in the southeast corner of the storage yard. Site representatives indicated that this material was what remained from the spill of a possibly hazardous waste in March 1990; the area was exposed because snow covering the storage yard had melted (Barach 1990). Irathane personnel were shoveling the material into a pail during the FIT inspection. Two areas of soil stained by a black, organic substance were observed in the unpaved area in the southwest corner of the storage yard. It is not known what had caused these stains. Another black stain was observed on the soil of the unpaved area in the northwest corner of the storage yard. Irathane employees were also attempting to remove this material during the inspection.

Approximately 130 empty drums were stacked along the west border of the paved portion of the storage yard, adjacent to the warehouse. Site representatives indicated that raw materials had been shipped to the facility in these drums (Barach 1990). The Irathane facility's finished product, orange polyurethane gears used for mining, was observed along the building on the unpaved area in the southwest corner of the site. This finished product, as well as miscellaneous machinery and parts used at the facility, was observed along the south-central portion of the storage yard. Piles of old rubber tires lined the fence along the northeast corner and along the eastern side of the storage yard.

A small, unpaved area containing the finished product, including pipes and gears, was also located just south of the storage yard between the fence and the paved access road. A grass lawn located on the west portion of the site was the only vegetated area on-site.

FIT photographs from the SSI of the ISI site are provided in Appendix C.

3.4 SAMPLING PROCEDURES

Samples were collected by FIT at locations selected during the reconnaissance inspection to determine whether U.S. EPA Target Compound List (TCL) compounds or Target Analyte List (TAL) analytes were present at the site. The TCL and TAL are included with corresponding quantitation/detection limits in Appendix D.

On April 5, 1990, FIT collected four on-site soil samples from the ISI site and one off-site potential background sample. Portions of the soil samples were offered to the site representatives and were accepted.

Soil Sampling Procedures. All soil samples were collected at the ground surface at depths ranging from 6 to 12 inches. Samples at greater depths could not be collected because of the frozen condition of the ground.

On-site soil samples S1, S2, S3, and S4 were collected from the two unpaved areas in the storage yard (see Figure 3-3 for on-site soil sampling locations). Soil sample S1 was a composite sample collected from two locations in the area where possibly hazardous waste was spilled in March 1990. This sample was collected while Irathane personnel were removing the spilled material. Soil sample S2 was a grab sample collected from an area of stained soil located in the center of the unpaved area in the southwest corner of the storage yard. Soil sample S3 was a composite sample collected from three locations in an area of stained soil in the northeast corner of the unpaved area in the southwest corner of the storage yard. Soil sample S4 was collected from the area adjacent to where FIT observed a black stain of spilled organic material. These sample locations were chosen to determine whether TCL compounds or TAL analytes had entered the soil.

Soil sample S5, the potential background sample, was a grab sample collected from a small wooded area approximately 1 mile north of the site (see Figure 3-4 for the off-site soil sampling location). This location was selected because it appeared to be a relatively undisturbed area. The background sample was collected to determine the representative chemical content of the soil in the area of the site.

The samples were collected using a pickaxe and shovel to reach the required depth; a hand trowel was then used to collect the samples. For the composite sample, volatile organic analysis (VOA) portions from the

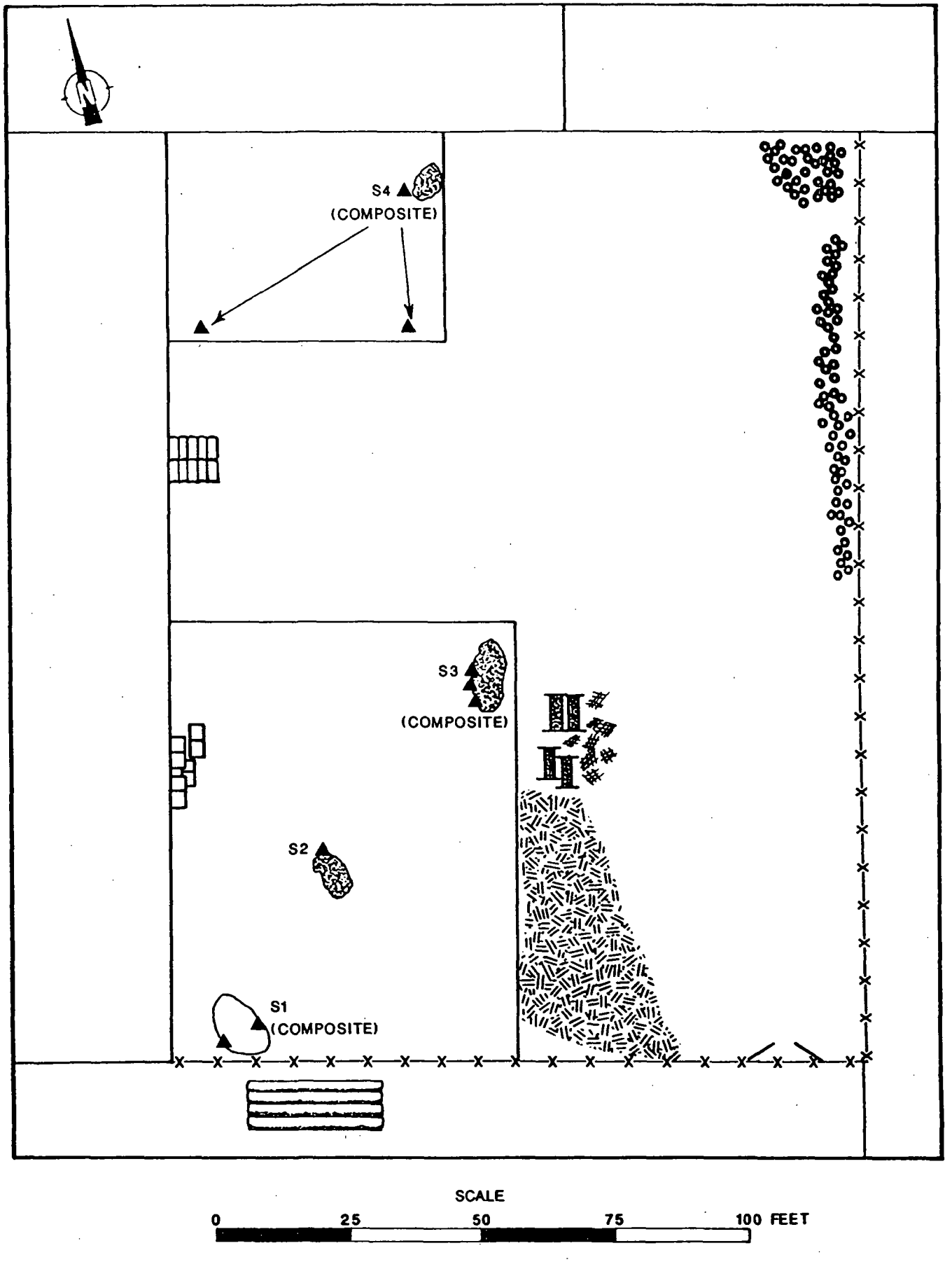
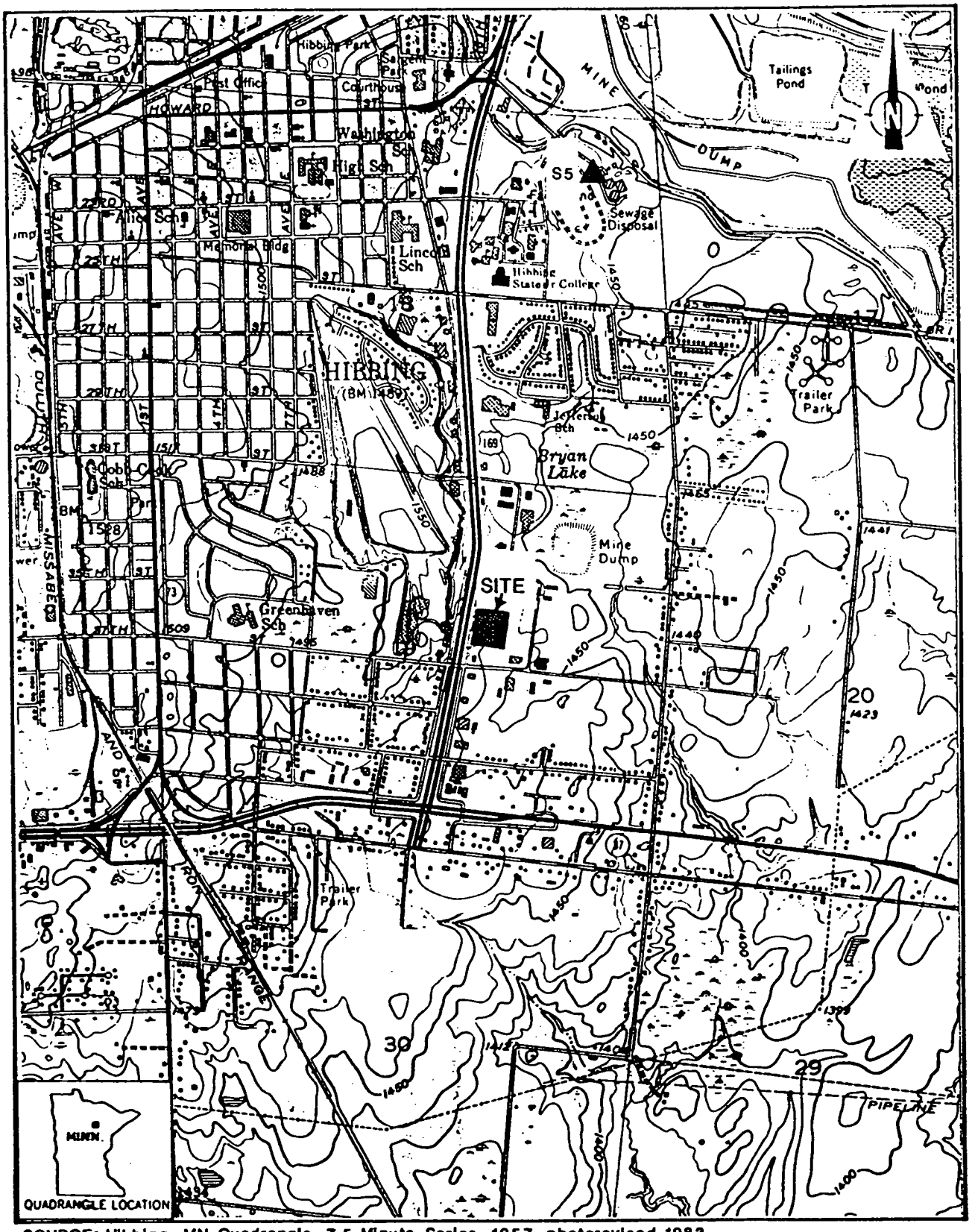


FIGURE 3-3 ON-SITE SOIL SAMPLING LOCATIONS



SOURCE: Hibbing, MN Quadrangle, 7.5 Minute Series, 1957, photorevised 1983.

FIGURE 3-4 OFF-SITE SOIL SAMPLING LOCATION

different locations were placed directly in the sample bottles. The remaining soil portions were placed in a stainless steel bowl and mixed together to obtain a homogeneous sample. The sample material was then transferred to the remaining sample bottles using the hand trowel (E & E 1987). For the grab samples, the soil sample material was transferred directly to the sample bottles, VOA portions first, using the hand trowel.

Standard E & E decontamination procedures were adhered to during the collection of all soil samples. The procedures included the scrubbing of all equipment (e.g., hand trowels, pickaxe, shovel, and bowls) with a solution of detergent (Alconox) and distilled water, and triple-rinsing the equipment with distilled water before the collection of each sample (E & E 1987). All soil samples were packaged and shipped in accordance with U.S. EPA-required procedures.

As directed by U.S. EPA, all soil samples were analyzed using the U.S. EPA Contract Laboratory Program (CLP).

4. ANALYTICAL RESULTS

This section presents results of the chemical analysis of FIT-collected soil samples for TCL compounds and TAL analytes. All samples were analyzed for volatile organics semivolatile organics, pesticides polychlorinated biphenyls (PCBs), metals, and cyanides. Complete chemical analysis results of FIT-collected soil samples are provided in Table 4-1.

Quantitation/detection limits used in the analysis of soil samples are provided in Appendix D.

The analytical data for the chemical analysis of soil samples collected for this SSI have been reviewed by U.S. EPA and FIT for compliance with terms of CLP and the review has been approved by U.S. EPA. Any additions, deletions, or changes to the data have been incorporated in the chemical analysis results tables presented in this section.

Table 4-1
RESULTS OF CHEMICAL ANALYSIS OF
FIT-COLLECTED SOIL SAMPLES

Sample Collection Information and Parameters	Sample Number S1	S2	S3	S4	S5
Date	4/5/90	4/5/90	4/5/90	4/5/90	4/5/90
Time	1010	1025	1045	1105	1200
CRL Log Number	EJY42	EJY43	EJY44	EJY45	EJY46
CLP Inorganic Traffic Report Number	MEJA30	MEJA31	MEJA32	MEJA33	MEJA34
Compound Detected (values in µg/kg)					
Volatile Organics					
methylene chloride	430JBD	75JB	6J	--	--
acetone	45J	--	510J	--	16J
2-butanone (MEK)	4J	--	140J	--	10J
trichloroethene	3J	7	--	--	--
benzene	5J	1J	24J	14	--
toluene	12	2J	61J	40J	--
ethylbenzene	--	--	21J	5J	--
styrene	--	--	8J	2J	--
xylenes (total)	--	--	13J	2J	--
Semivolatile Organics					
benzoic acid	--	--	--	--	9,100J
pyrene	--	--	78J	--	--
Analyte Detected (values in mg/kg)					
aluminum	9,180	7,580	3,860	1,890	13,000
antimony	--	--	27.1NJ	--	--

Table 4-1 (Cont.)

Sample Collection Information and Parameters	Sample Number S1	S2	S3	S4	S5
arsenic	2.1BNJ	7.3NJ	45.3NJ	20.2NJ	3.4NJ
barium	110	29.2B	31B	11.3B	91.2
beryllium	0.54B	0.2B	--	5.5	0.3B
cadmium	1.30EJ	5.2EJ	17.4EJ	52.2EJ	--
calcium	4,070	3,620	2,000	664B	2,640
chromium	201EJ	166EJ	490EJ	908EJ	33.5EJ
cobalt	8.6BEJ	10.1EJ	--	171EJ	11.8BEJ
copper	44	149	1,080	421	14.8
iron	38,100	90,900	395,000	618,000	23,500
lead	1,190NJ	13.6NJ	22.5NJ	3.9NJ	38.8NJ
magnesium	5,880	4,890	2,320	968B	4,330
manganese	530	998	2,360	5,900	789
mercury	0.80	--	0.27	411	--
nickel	35.1	124	352	145B	25.4
potassium	726B	465B	429B	--	945B
selenium	0.32B	0.18B	0.23B	--	0.33B
sodium	299B	400B	246B	--	--
vanadium	45.9	39.7	87.7	48.9	42.9
zinc	104EJ	421EJ	232EJ	77.5EJ	112EJ
cyanide	5.2	1.1	--	--	--

-- Not detected.

Table 4-1 (Cont.)

COMPOUND QUALIFIERS	DEFINITION	INTERPRETATION
J	Indicates an estimated value.	Compound value may be semiquantitative.
B	This flag is used when the compound is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.	Compound value may be semiquantitative if it is <5x the blank concentration (<10x the blank concentrations for common laboratory artifacts: phthalates, methylene chloride, acetone, toluene, 2-butanone).
D	This flag identifies all compounds identified in an analysis at a secondary dilution factor.	Alerts data user to a possible change in the CRQL. Data is quantitative.

ANALYTE QUALIFIERS	DEFINITION	INTERPRETATION
E	Estimated or not reported due to interference. See laboratory narrative.	Analyte or element was not detected, or value may be semiquantitative.
N	Spike recoveries outside QC protocols, which indicates a possible matrix problem. Data may be biased high or low. See spike results and laboratory narrative.	Value may be quantitative or semiquantitative.
B	Value is real, but is above instrument DL and below CRDL.	Value may be quantitative or semiquantitative.
J	Value is above CRDL and is an estimated value because of a QC protocol.	Value may be semiquantitative.

5. DISCUSSION OF MIGRATION PATHWAYS

5.1 INTRODUCTION

This section presents discussions of data and information pertaining to potential migration pathways and targets of TCL compounds and TAL analytes that are possibly attributable to the ISI site.

The five migration pathways of concern discussed are groundwater, surface water, air, fire and explosion, and direct contact.

5.2 GROUNDWATER

Groundwater sampling was not conducted at the ISI site because of the absence of a sufficient number of available wells finished in the aquifer of concern (AOC) in the vicinity of the site. However, a potential does exist for TCL compounds and TAL analytes to migrate from the site to groundwater in the vicinity of the site. A number of on-site factors exist that increase the potential for the migration to occur, including the following.

- A large number of TCL compounds and TAL analytes were detected in on-site soil samples at concentrations greater than those found in the background sample, S5.

- Hazardous wastes are known to have been stored on-site; some of these wastes were stored in unpaved areas where no liners were known to be present to protect the ground from potential leaks.

- At least one spill of potentially hazardous waste material on-site has been documented; several additional spills have reportedly occurred.

- No continuous confining layer exists that separates the site from the AOC.

Two TCL compounds that are documented to have been used on-site were detected in elevated concentrations in on-site soil samples; 2-butanone (MEK), at 14 times the background sample; and toluene, which was not detected in the background sample. A number of TAL analytes were detected in elevated concentrations in on-site soil samples and are documented to have been used on-site, including: arsenic, detected at 13 times background; chromium, at 27 times background; copper, at 75 times background; lead, at 32 times background; mercury, which was not detected in the background sample; and nickel, at 14 times background (see Table 4-1 for analytical data).

The geology in the vicinity of the site also adds to the potential of groundwater contamination. The Quaternary geology in the area is pitted to hilly moraine composed of calcareous silts and clays which were deposited by the Des Moines lobe of late Wisconsinan-age glaciers (Sims and Morcey 1972; Goebel and Walton 1979). The glacial drift consists of three major till units, referred to in descending order as surficial till, bouldary till, and basal till. The bouldary till, the middle till unit, is the thickest and most continuous of the three units. Stratified fluvial sediments occur extensively between the three till layers and are important aquifers (Winter 1973).

The glacial drift near the ISI site ranges from less than 100 feet to approximately 200 feet thick (see Appendix E for area well logs). The surficial geology is dominated by a red, silty clay till which ranges in thickness from 3 feet to approximately 100 feet. Clay lenses are also dispersed throughout the glacial drift; however, these lenses do not appear to be continuous (see Appendix E) (Winter 1973; Kanivetsky 1979).

The bedrock in the area of the ISI site is the Precambrian Virginia Formation which consists of argillite, siltstone, and graywacke. The

thickness of the bedrock formation ranges from less than 100 feet to greater than 1,400 feet (Winter 1973). The upper portion of the Virginia Formation contains many fractures that contain water and comprise another aquifer (Lindholm et al. 1979). The glacial drift and the Virginia Formation appear to be hydraulically connected because of the absence of a confining layer and constitute a single aquifer, the AOC. The depth to the AOC is approximately 40 feet in the vicinity of the site (see Appendix E) (Winter 1973). Cretaceous-age shales intermixed with clay overlie the Virginia Formation, but do not appear to be continuous (Winter 1973).

All drinking water in the area of the site is obtained from groundwater within the AOC (Olin 1989). The private residential wells located near the site are screened at depths ranging from approximately 40 feet to greater than 100 feet (see Appendix E). The city of Hibbing operates a number of municipal wells located within a 3-mile radius of the site that draw from the AOC. These wells range in depth from 100 feet to approximately 550 feet. The primary well used by the city is the Scranton Mine Well, located just north of the city, approximately 2 miles north of the site. The city of Hibbing serves approximately 20,000 people, including the residents of the surrounding communities of Kitzville, Lectonia, and Kelly Lake (Olin 1989). The drinking water well that is nearest to the site and draws from the AOC is a private residential well approximately 1 mile southeast of the site (United States Geological Survey [USGS] 1957).

The regional groundwater flow is predominantly southwesterly toward the St. Louis River. Locally, groundwater flow is influenced by the slope of the topography of the land which is to the south (Sims and Morcey 1972).

Approximately 20,700 people within a 3-mile radius of the site could potentially be affected by TCL compounds and/or TAL analytes migrating from the site to the AOC. The groundwater target population includes the approximately 20,000 residents served by the city of Hibbing municipal water system (Olin 1989), and the approximately 700 residents using private residential wells screened in the AOC.

The population using private residential wells was calculated by using USGS topographic maps of the area (USGS 1951, 1952, 1957) to count

the number of houses located outside of the Hibbing municipal water service boundaries and within a 3-mile radius of the site, for a total of 266. This number was then multiplied by a persons-per-household value of 2.65 for St. Louis County (U.S. Bureau of the Census 1982).

5.3 SURFACE WATER

Surface water samples were not collected at the ISI site because no potential overland migration pathways were observed at the site. Bryan Lake, located approximately 1/4 mile northeast of the site (USGS 1957) is the surface water body nearest to the site. The potential for overland migration of TCL compounds and TAL analytes from the site to Bryan Lake does not exist. The terrain in the area of the site slopes slightly to the southeast, away from the lake.

Surface water is not used for drinking water in the area of the site.

5.4 AIR

A release of TCL compounds or TAL analytes to the air was not documented during the SSI of the ISI site. During the reconnaissance inspection, FIT site-entry instruments (OVA 128, colorimetric tubes for monitoring hydrogen cyanide, radiation detector, oxygen meter, and explosimeter) did not detect levels above background concentrations at the site. In accordance with the U.S. EPA-approved work plan, further air monitoring was not conducted by FIT.

A potential does exist for TCL compounds and TAL analytes to migrate from the site via windblown particulates because of the lack of vegetation in the areas where the TCL compounds and TAL analytes were detected.

The population within a 4-mile radius of the site potentially affected by a release of TCL compounds and TAL analytes to the air is approximately 22,500 persons. This population was calculated by counting houses within a 4-mile radius of the site on USGS topographic maps (USGS 1951, 1952, 1957) and multiplying this number by a persons-per-household value of 2.65, and adding the portion of the population of Hibbing, Minnesota, which is located within the 4-mile radius of the site.

5.5 FIRE AND EXPLOSION

According to federal, state, and local file information reviewed by FIT, and an interview with the site representatives, no documentation exists of an incident of fire or explosion at the site. According to FIT observations and site-entry equipment readings, no potential for fire or explosion existed at the site at the time of the SSI.

5.6 DIRECT CONTACT

According to federal, state, and local file information reviewed by FIT, observations made during the SSI, and the interview with site representatives, no incidents of direct contact with TCL compounds or TAL analytes at the ISI site have been documented.

There is a potential for the approximately 20 on-site Irathane workers to come into contact with the TCL compounds and/or TAL analytes that were detected on-site. The potential for the general population to come into contact with the TCL compounds or TAL analytes detected on-site does not exist because access to the area where contaminants were detected is limited by a fence and a locked gate.

6. REFERENCES

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5618:8

APPENDIX A

SITE 4-MILE RADIUS MAP

HIBBING MUNICIPAL WELL (SCRANTON WELL)

WELL LOG # 2

HIBBING MUNICIPAL WELL (NEW SCRANTON WELL)

WELL LOG # 1

HIBBING MUNICIPAL WELL NO. 15

WELL LOG # 5

SITE

WELL LOG # 3

HIBBING MUNICIPAL WATER BOUNDARY

1 MILE

HIBBING MUNICIPAL WELL NO. 11

HIBBING MUNICIPAL WELL NO. 8

WELL LOG # 4

2 MILE

HIBBING MUNICIPAL WELL NO. 7

HIBBING MUNICIPAL WELL NO. 12

HIBBING MUNICIPAL WELL NO. 3

HIBBING MUNICIPAL WELL NO. 12A

HIBBING MUNICIPAL WELL NO. 10

3 MILE

HIBBING MUNICIPAL WELL NO. 16

HIBBING MUNICIPAL WELL NO. 13

HIBBING MUNICIPAL WELL NO. 2

4 MILE

SCALE 1:24 000

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 MILE

1 KILOMETER

CONTOUR INTERVAL 10 FEET

T. 58 N.

T. 57 N.

T. 56 N.

R. 21 W.

R. 20 W.

T U N T Z

ecology and environment, inc.

SITE NAME IRATHANE SYSTEMS, INC.

U.S. EPA ID# MND022816306

USGS TOPOGRAPHIC MAPS:

NAME KEEWATIN, MN	NAME HIBBING, MN	NAME BUHL, MN
DATE 1952	DATE 1957	DATE 1951
REVISED 1976	REVISED 1983	REVISED 1976
NAME SILICA, MN	NAME RILEY, MN	NAME LITTLE SWAN, MN
DATE 1952	DATE 1952	DATE 1952
REVISED 1976	REVISED 1969	REVISED 1969

SCALE 0 ½ 1 MILE

MINN

QUADRANGLE LOCATION

APPENDIX B

U.S. EPA FORM 2070-13

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

EPA

I. IDENTIFICATION
01 STATE: MN | 02 SITE NUMBER: D022818306

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
IRATHANE SYSTEMS, INC	3516 13TH AVE EAST

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
HIBBING	MN	55746	ST. LOUIS	137	08

09 COORDINATES: LATITUDE 47° 24' 29." | LONGITUDE 092° 55' 22."

10 TYPE OF OWNERSHIP (Check one): ■ A. PRIVATE ☐ B. FEDERAL _____ ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
04/05/90 (MONTH DAY YEAR)	■ ACTIVE ☐ INACTIVE	1977 (BEGINNING YEAR) | PRESENT (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply):
☐ A. EPA ■ B. EPA CONTRACTOR ECOLOGY & ENVIRONMENT (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☐ G. OTHER _____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
TED NEHRKORN	ENVIRONMENTAL ENGINEER	E & E	(312) 663-9415
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
MICHAEL MCATEER	GEOGRAPHER	E & E	(312) 663-9415
SAM BORRIES	GEOLOGIST	E & E	(312) 663-9415
JENNIFER DUBAY	NATURAL RESOURCE MANAGER	E & E	(312) 663-9415
NATHAN RUSSELL	GEOLOGIST	E & E	(312) 663-9415
CORTNEY SCHMIDT	WATER RESOURCES MANAGER	E & E	(312) 663-9415

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
JOSEPH D. BARACH	MANAGER - R&D, QUALITY ASSURANCE	IRATHANE SYSTEMS, INC 4045 SINTON RD COLORADO SPRINGS, CO 80907	(719) 636-5286
PHILIP S. DALLOSTO	SENIOR ATTORNEY ASSOC. SECRETARY	ILLINOIS TOOL WORKS, INC 8501 WEST HIGGINS RD CHICAGO, IL 60631	(312) 693-3040
MICHAEL J. HOFFMAN	MANAGER - INDUSTRIAL SERVICES	ENVIRONMENTAL SCIENCE & ENG. 8901 N. INDUSTRIAL RD. PEORIA, IL 61615	(309) 692-9422
LAURIE POTTER	ENVIRONMENTAL CONSULTANT	POTTER & ASSOCIATES COOK, MN 55723	(218) 666-5437
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
■ PERMISSION ☐ WARRANT	0730	SUNNY, WINDY, COLD, TEMPERATURE UPPER TEENS

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO.
RON SWENSON	MINNESOTA POLLUTION CONTROL AGENCY	(612) 297-1793

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
TED NEHRKORN	US EPA/ FIT	E & E	(312) 663-9415	7/23/90 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MN	D022818306

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [x] A. SOLID
- [ ] B. POWDER, FINES
- [ ] C. SLUDGE
- [ ] D. OTHER (Specify)
- [ ] E. SLURRY
- [x] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS: UNKNOWN
CUBIC YARDS:
NO. OF DRUMS: UNKNOWN

03 WASTE CHARACTERISTICS (Check all that apply)

- [x] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [x] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			SEE SITE HISTORY
SOL	SOLVENTS			SUBSECTION 2.3 IN
PSD	PESTICIDES			NARRATIVE.
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
	FOR SPECIFIC HAZARDOUS				
	SUBSTANCES FOUND, PLEASE				
	REFER TO TABLE 4-1,				
	CHEMICAL ANALYSIS OF				
	SOIL SAMPLES SUMMARY				
	SHEET.				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS	EURATHAN PREPOLYMERS		FDS	PRIMERS	
FDS	EURATHANE POLYOLS		FDS		
FDS	ADHESIVES		FDS		
FDS	PLASTISIZERS		FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E - Chicago - REGION V

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ■ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ■ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~20,700 — 04 NARRATIVE DESCRIPTION

See Subsection 5.2 of Narrative.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

See Subsection 5.3 of Narrative.

01 ■ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ■ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~22,500 — 04 NARRATIVE DESCRIPTION

See Subsection 5.4 of Narrative.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

See Subsection 5.5 of Narrative.

01 ■ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ■ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~20 — 04 NARRATIVE DESCRIPTION

See Subsection 5.6 of Narratne.

01 ■ F. CONTAMINATION OF SOIL — 02 ■ OBSERVED (DATE: 4/5/90) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: ~1/2 (Acres) — 04 NARRATIVE DESCRIPTION

See Table 4-1 for Analytical Summary

01 ■ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ■ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~20,700 — 04 NARRATIVE DESCRIPTION

See Subsection 5.2 of Narrative

01 ■ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ■ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ~20 — 04 NARRATIVE DESCRIPTION

See Subsection 5.6 of Narrative.

01 ■ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ■ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~23,500 — 04 NARRATIVE DESCRIPTION

See Section 5 of Narrative.

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: MN | 02 SITE NUMBER: D022618316

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

THERE IS A POTENTIAL FOR TCL COMPOUNDS OR TAL ANALYTES DETECTED ON SITE TO MIGRATE OFF SITE BECAUSE OF THE SLIGHT SLOPE AND THE LACK OF ANY CURBING ON SITE. LOCAL FLORA CAN BE DAMAGED BECAUSE OF THIS.

01 ☒ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include names of species)

LOCAL FAUNA MAY POTENTIAL FEED ON AFFECTED FLORA.

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

LOW POTENTIAL, SEE J AND K ABOVE

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/Runoff/Standing liquids, Leaking drums) — 02 ☒ OBSERVED (DATE: 4/1980) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~22,500 — 04 NARRATIVE DESCRIPTION

SPILLED MATERIAL OBSERVED ON GROUND. THE POPULATION POTENTIALLY AFFECTED INCLUDE THE ~220 ON-SITE WORKERS WHO MAY WORK IN THE AREA.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

NONE OBSERVED DURING SSI. NO INCIDENTS HAVE BEEN REPORTED.

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION

ALLEGATIONS WERE MADE THAT THE COMPANY HAD SEWERING OF HAZARDOUS WASTES BY THE COMPANY. THE ALLEGATIONS RESULTED FROM A COMPLAINT FILED BY AN UNKNOWN PERSON(S) WITH THE MPCA. THE OCCURRANCE DISCUSSED WAS IN DECEMBER 1981. JEANNE DENIES THIS.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

NO ILLEGAL OR UNAUTHORIZED DUMPING HAS OCCURED ON SITE OR IS ALLEGED BESIDES WHAT IS DISCUSSED IN SECTION O.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

THERE WERE NO OTHER HAZARDS OR POTENTIAL HAZARDS OBSERVED ON SITE. A FORMER EMPLOYEE DID COMPLAIN OF AN EXPOSURE TO MOCA IN THE LATE 1970S.

III. TOTAL POPULATION POTENTIALLY AFFECTED: ~22,500

IV. COMMENTS

THE MAJORITY OF THE HAZARDOUS WASTES PRODUCED ON SITE ARE STORED INSIDE OF THE WAREHOUSE SECTION OF THE FACILITY PRIOR TO BEING SHIPPED OFF SITE.

V. SOURCES OF INFORMATION (Cite specific references, e.g., State files, sample analysis, reports)

E&E - CHICAGO, REGION V

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
MN	D022818306

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
■ G. STATE (Specify)	N/A	7/25/86	N/A	CONDISPOSAL OF WASTE AT HIGGINS LOFL.
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
■ C. DRUMS, ABOVE GROUND	UNKNOWN	
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply) N/A
- ☐ A. INCINERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- ■ A. BUILDINGS ON SITE

1 BUILDING

06 AREA OF SITE

~5 (Acres)

07 COMMENTS

IRATHANE IS A SMALL QUANTITY HAZARDOUS WASTE GENERATOR UNDER RCRA AND DOES NOT NEED A PERMIT FOR THIS REASON.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ■ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

ALL STORAGE OF HAZARDOUS WASTES IS INSIDE OF THE WAREHOUSE PORTION OF THE FACILITY. THE MATERIAL IS STORED IN 55-GALLON DRUMS. AT LEAST ONE SPILL HAS OCCURED OUTSIDE OF THE FACILITY IN MARCH 1990. PAST PRACTICES INCLUDED STORAGE OF WASTES IN DRUMS OUTSIDE IN A STORAGE YARD

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ■ NO

02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EPE-CHICAGO, REGION V

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: MN | 02 SITE NUMBER: D022818306

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS: ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☐	B. ■	A. ☐	B. ☐	C. ■	A. ~1 1/2 (mi)
NON-COMMUNITY	C. ☐	D. ■	D. ☐	E. ☐	F. ☐ UNKNOWN	B. ~1 (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

■ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER: ~20,700

03 DISTANCE TO NEAREST DRINKING WATER WELL: ~1 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
~40 (ft)	SOUTHEAST	~40 (ft)	UNKNOWN (gpd)	☐ YES ■ NO

09 DESCRIPTION OF WELLS (Including acreage, depth, and location relative to population and buildings)

SEE SUBSECTION 5.2 OF NARRATIVE.

10 RECHARGE AREA		11 DISCHARGE AREA	
■ YES ☐ NO	COMMENTS: THROUGH INFILTRATION TO LOCAL GROUNDWATER	■ YES ☐ NO	COMMENTS: TO LOCAL STREAMS AND LAKES

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

■ A. RESERVOIR, RECREATION, DRINKING WATER SOURCE ☐ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
NONE DOWN GRADIENT WITHIN 3 MILES	☐	(mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. ~8,000 NO. OF PERSONS	B. ~13,600 NO. OF PERSONS	C. ~20,700 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: ADJACENT TO SITE (pit)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: ~900

04 DISTANCE TO NEAREST OFF-SITE BUILDING: ADJACENT TO SITE (pit)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

SEE SUBSECTION 3.4 OF NARRATIVE.

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. 10^{-6} – 10^{-8} cm/sec ☐ B. 10^{-4} – 10^{-6} cm/sec ☐ C. 10^{-4} – 10^{-3} cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☒ B. RELATIVELY IMPERMEABLE (10^{-4} – 10^{-6} cm/sec) ☐ C. RELATIVELY PERMEABLE (10^{-2} – 10^{-4} cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH	
<100 - 200 (ft)	UNKNOWN (ft)	NA	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE		
		SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
~2.1 (in)	~2.1 (in)	<3 %	SOUTHEAST	<3 %

09 FLOOD POTENTIAL	10
SITE IS IN NA YEAR FLOODPLAIN	N/A ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE	OTHER
A. >3 (mi)	B. >3 (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

~2 (mi)

ENDANGERED SPECIES: GRAY WOLF

13 LAND USE IN VICINITY

DISTANCE TO:			
COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS PRIME AG LAND	AG LAND
A. ON-SITE (mi)	B. ~1/8 (mi)	C. NA (mi)	D. NA (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

SEE APPENDIX A IN NARRATIVE

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPE-CHICAGO, REGION V

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	5	SEE SUBSECTION 3.4 IN NARRATIVE	ON FILE
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
OVA 128	NO READINGS ABOVE ZERO OBTAINED IN BREATHING ZONE ON SITE.
EXPLOSIMETER	NO READINGS ABOVE ZERO OBTAINED ON SITE
OXYGEN METER	ALL READINGS OBTAINED ON SITE WERE WITHIN THE NORMAL RANGE.
HYDROGEN CYANIDE DETECTOR	NO READINGS ABOVE ZERO OBTAINED ON SITE
RAD-MINI	NO READINGS ABOVE ZERO OBTAINED ON SITE

IV. PHOTOGRAPHS AND MAPS

01 TYPE ■ GROUND □ AERIAL

02 IN CUSTODY OF ECOLOGY AND ENVIRONMENT, INC., CHICAGO, REGION V
(Name of organization or individual)

03 MAPS ■ YES □ NO

04 LOCATION OF MAPS ECOLOGY AND ENVIRONMENT, INC. CHICAGO, IL - REGION V

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

NONE

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E&E CHICAGO REGION V

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. CURRENT OWNER(S)

Field	Value
01 NAME	MESABA REALTY COMPANY
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	P.O. BOX 568
04 SIC CODE	
05 CITY	HIBBING
06 STATE	MN
07 ZIP CODE	55746
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	

PARENT COMPANY (If applicable)

Field	Value
08 NAME	N/A
09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
11 SIC CODE	
12 CITY	
13 STATE	
14 ZIP CODE	
08 NAME	
09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
11 SIC CODE	
12 CITY	
13 STATE	
14 ZIP CODE	
08 NAME	
09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
11 SIC CODE	
12 CITY	
13 STATE	
14 ZIP CODE	
08 NAME	
09 D+B NUMBER	
10 STREET ADDRESS (P.O. Box, RFD #, etc.)	
11 SIC CODE	
12 CITY	
13 STATE	
14 ZIP CODE	

III. PREVIOUS OWNER(S) (List most recent first)

Field	Value
01 NAME	IRATHANE SYSTEMS, INC.
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	3516 13TH AVENUE EAST
04 SIC CODE	
05 CITY	HIBBING
06 STATE	MN
07 ZIP CODE	55746
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	

IV. REALTY OWNER(S) (If applicable; list most recent first)

Field	Value
01 NAME	N/A
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	
01 NAME	
02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	
04 SIC CODE	
05 CITY	
06 STATE	
07 ZIP CODE	

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E CHICAGO, REGION V

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
IRATHANE SYSTEMS, INC	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
3516 13TH AVE. EAST	

05 CITY	06 STATE	07 ZIP CODE
HIBBING	MN	55746

08 YEARS OF OPERATION	09 NAME OF OWNER
~ 13	

OPERATOR'S PARENT COMPANY (if applicable)

10 NAME	11 D+B NUMBER
ILLINOIS TOOL WORKS, INC.	

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
8501 WEST HIGGINS RD	

14 CITY	15 STATE	16 ZIP CODE
CHICAGO	IL	60631

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

PREVIOUS OPERATORS' PARENT COMPANIES (if applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
N/A		N/A	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EE-E- CHICAGO, REGION V

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
IRATHANE SYSTEMS, INC.	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
3516 13TH AVE EAST	

05 CITY	06 STATE	07 ZIP CODE
HIBBING	MN	55746

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
N/A			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY	06 STATE / 07 ZIP CODE	05 CITY	06 STATE / 07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
SAFETY KLEEN		WORUM CHEMICAL	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
2109 1/2 WARD AVE		2130 KASOTA	
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
LA CROSSE / WI / 54601		ST. PAUL / MN / 55108	
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
VAN WATERS & ROGERS			
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
111 22ND AVE NE			
05 CITY / 06 STATE / 07 ZIP CODE		05 CITY / 06 STATE / 07 ZIP CODE	
MINNEAPOLIS / MN / 55418			

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E&E - CHICAGO, REGION V

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: MN | 02 SITE NUMBER: D022818306

II. PAST RESPONSE ACTIVITIES

01 ☐ A. WATER SUPPLY CLOSED NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ B. TEMPORARY WATER SUPPLY PROVIDED NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ C. PERMANENT WATER SUPPLY PROVIDED NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☒ D. SPILLED MATERIAL REMOVED | 02 DATE 3/90 | 03 AGENCY TRATH ANE VOLUNTEER
04 DESCRIPTION A SPILL OF APPROXIMATELY 25 POUNDS OF MATERIAL OCCURED IN THE STORAGE AREA IN MARCH 1990. THE MATERIAL WAS CLEANED UP IN MARCH AND APRIL 1990 AND PLACED IN A DRUM. THE DRUM WAS AWAITING TRANSPORT.

01 ☒ E. CONTAMINATED SOIL REMOVED | 02 DATE 5/90 | 03 AGENCY TRATHANE VOLUNTEER
04 DESCRIPTION SOME SOIL WAS REMOVED DURING THE CLEAN UP PROCEDURES IN SECTION D.

01 ☐ F. WASTE REPACKAGED | 02 DATE | 03 AGENCY
04 DESCRIPTION NA

01 ☐ G. WASTE DISPOSED ELSEWHERE NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ H. ON SITE BURIAL NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ I. IN SITU CHEMICAL TREATMENT NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ J. IN SITU BIOLOGICAL TREATMENT NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ K. IN SITU PHYSICAL TREATMENT NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ L. ENCAPSULATION NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ M. EMERGENCY WASTE TREATMENT NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ N. CUTOFF WALLS NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ O. EMERGENCY DIKING/SURFACE WATER DIVERSION NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ P. CUTOFF TRENCHES/SUMP NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

01 ☐ Q. SUBSURFACE CUTOFF WALL NA | 02 DATE | 03 AGENCY
04 DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES NA — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E & E - CHICAGO, REGION V

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
MN	D022818306

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ■ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

SEE SUBSECTION 2.3 OF NARRATIVE.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

E&E - CHICAGO, REGION V

APPENDIX C

FIT SITE PHOTOGRAPHS

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 1 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1235

DIRECTION OF PHOTOGRAPH: E

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: West side of on site building. Offices are located in this section

DATE: 4/5/90

TIME: 1235

DIRECTION OF PHOTOGRAPH: E

WEATHER CONDITIONS: Sunny, Cold, Windy Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: West side of Warehouse portion of building.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 2 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90 TIME: 1230 DIRECTION OF PHOTOGRAPH: N PHOTOGRAPHED BY: T. NehrKorn

WEATHER CONDITIONS: Sunny, Cold, Windy, Upper Teens SAMPLE ID (if applicable): _____

DESCRIPTION: South side of on site building. The warehouse is located here.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 3 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90 TIME: 1235 DIRECTION OF PHOTOGRAPH: S-SE PHOTOGRAPHED BY: T. NehrKorn

WEATHER CONDITIONS: Sunny, Cold, Windy, Upper Teens SAMPLE ID (If applicable): _____

DESCRIPTION: North side of building. Process area is located at this side.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 4 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

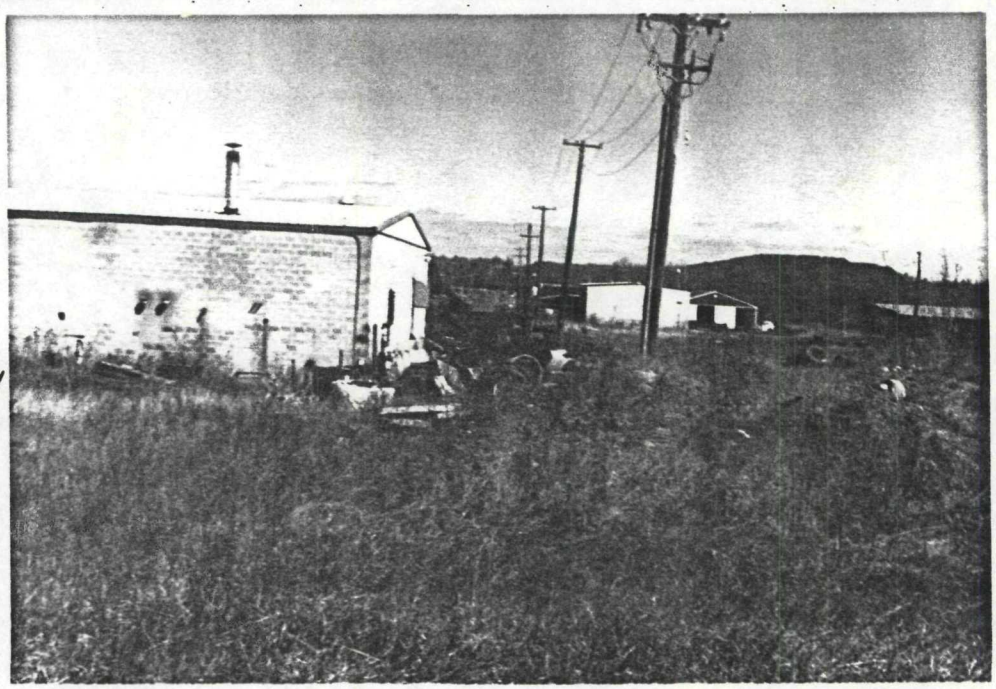
TIME: 1130

DIRECTION OF PHOTOGRAPH: N

WEATHER CONDITIONS: Sunny, Cold, Windy Upper Teens

PHOTOGRAPHED BY: T. Nehrkorn

SAMPLE ID (if applicable):



DESCRIPTION: East side of building.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 5 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90 TIME: 1130 DIRECTION OF PHOTOGRAPH: W PHOTOGRAPHED BY: T. NehrKorn

WEATHER CONDITIONS: Sunny, Cold, Windy, Upper Teens SAMPLE ID (if applicable): _____

DESCRIPTION: Perspective view of storage yard.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 6 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1125

DIRECTION OF PHOTOGRAPH: N

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: Gate to storage yard.

DATE: 4/5/90

TIME: 0929

DIRECTION OF PHOTOGRAPH: NW

WEATHER CONDITIONS: Sunny, Cold, Windy Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: Empty raw material drums located inside of storage yard.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 7 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 0935

DIRECTION OF PHOTOGRAPH: SW

WEATHER CONDITIONS: Sunny, Cold, Wind, Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: Irathane Systems, Inc. personnel cleaning up material from March spill.

DATE: 4/5/90

TIME: 0935

DIRECTION OF PHOTOGRAPH: W

WEATHER CONDITIONS: Sunny, Cold, Wind, Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: Close up view of spilled material.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 8 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 0933

DIRECTION OF PHOTOGRAPH: N

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: Finished product located outside of fence just south of storage yard.

DATE: 4/5/90

TIME: 0932

DIRECTION OF PHOTOGRAPH: S

WEATHER CONDITIONS: Sunny, Cold, Windy Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable):

DESCRIPTION: Finished product and miscellaneous equipment and parts located at south end of storage yard.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 9 OF 13

U.S. EPA ID: MND TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1020

DIRECTION OF PHOTOGRAPH: SW

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S1

DESCRIPTION: Close Up view of soil sample S1 sampling location.

DATE: 4/5/90

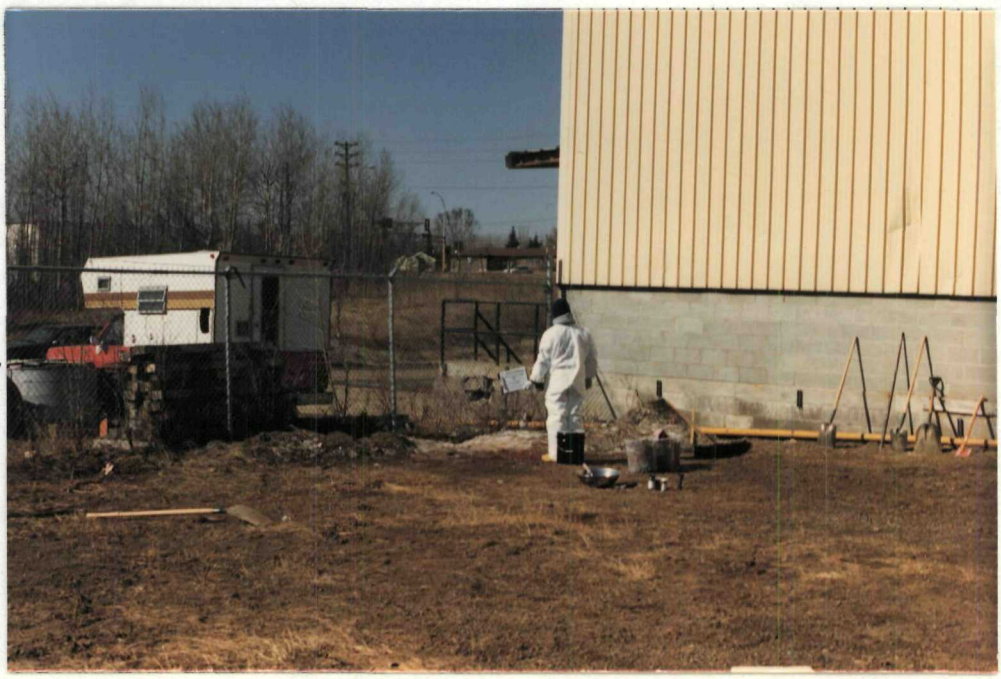
TIME: 1020

DIRECTION OF PHOTOGRAPH: SW

WEATHER CONDITIONS: Sunny, Cold, Windy Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S1



DESCRIPTION: Perspective view of soil sample S1 sampling location.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 10 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1030

DIRECTION OF PHOTOGRAPH: W

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S2

DESCRIPTION: Close up view of soil sample S2 sampling location

DATE: 4/5/90

TIME: 1030

DIRECTION OF PHOTOGRAPH: W

WEATHER CONDITIONS: Sunny, Cold, Windy Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S2

DESCRIPTION: Perspective View of soil sample S2 sampling location. Final Product is in the background.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: TRATHANE SYSTEMS, INC PAGE 11 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1045

DIRECTION OF PHOTOGRAPH: NE

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S3

DESCRIPTION: Close up view of soil sample S3 sampling location.

DATE: 4/5/90

TIME: 1045

DIRECTION OF PHOTOGRAPH: NE

WEATHER CONDITIONS: Sunny, Cold, Wind Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S3

DESCRIPTION: Perspective view of soil sample S3 sampling location.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 12 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1110

DIRECTION OF PHOTOGRAPH: NW

WEATHER CONDITIONS: Sunny, Cold, Windy

Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S4

DESCRIPTION: Close up view of soil sample S4 sampling location.

DATE: 4/5/90

TIME: 1110

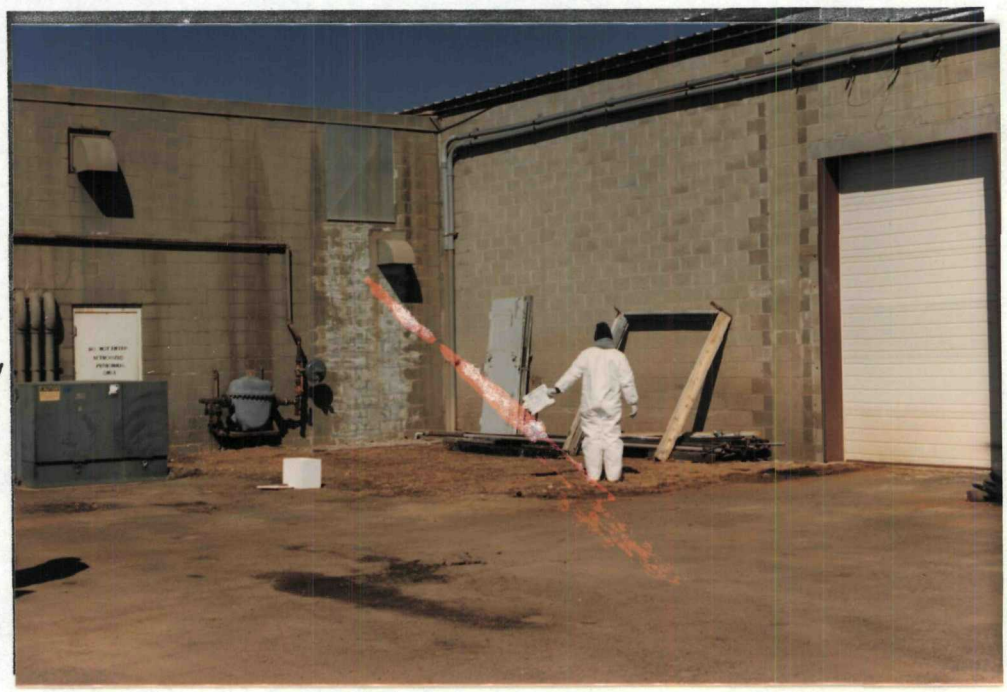
DIRECTION OF PHOTOGRAPH: NW

WEATHER CONDITIONS: Sunny, Cold, Windy

Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S4



DESCRIPTION: Perspective view of soil sample S4 sampling location.

FIELD PHOTOGRAPHY LOG SHEET

SITE NAME: IRATHANE SYSTEMS, INC PAGE 13 OF 13

U.S. EPA ID: MND022818306 TDD: F05-8910-012 PAN: FMN0230SB

DATE: 4/5/90

TIME: 1205

DIRECTION OF PHOTOGRAPH: S

WEATHER CONDITIONS: Sunny, Cold, Wind, Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S5

DESCRIPTION: Close up view of soil sample S5 sampling location

DATE: 4/5/90

TIME: 1205

DIRECTION OF PHOTOGRAPH: S

WEATHER CONDITIONS: Sunny, Cold, Wind, Upper Teens

PHOTOGRAPHED BY: T. NehrKorn

SAMPLE ID (if applicable): S5

DESCRIPTION: Perspective view of soil sample S5 sampling location.

APPENDIX D

U.S. EPA TARGET COMPOUND LIST AND TARGET ANALYTE LIST QUANTITATION/DETECTION LIMITS

ADDENDUM A

ROUTINE ANALYTICAL SERVICES
CONTRACT REQUIRED DETECTION AND QUANTITATION LIMITS

Contract Laboratory Program
Target Compound List
Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Chloromethane	74-87-3	10 ug/L	10 ug/Kg
Bromomethane	74-83-9	10	10
Vinyl chloride	75-01-4	10	10
Chloroethane	75-00-3	10	10
Methylene chloride	75-09-2	5	5
Acetone	67-64-1	10	5
Carbon disulfide	75-15-0	5	5
1,1-dichloroethene	75-35-4	5	5
1,1-dichloroethane	75-34-3	5	5
1,2-dichloroethene (total)	540-59-0	5	5
Chloroform	67-66-3	5	5
1,2-dichloroethane	107-06-2	5	5
2-butanone (MEK)	78-93-3	10	10
1,1,1-trichloroethane	71-55-6	5	5
Carbon tetrachloride	56-23-5	5	5
Vinyl acetate	108-05-4	10	10
Bromodichloromethane	75-27-4	5	5
1,2-dichloropropane	78-87-5	5	5
cis-1,3-dichloropropene	10061-01-5	5	5
Trichloroethene	79-01-6	5	5
Dibromochloromethane	124-48-1	5	5
1,1,2-trichloroethane	79-00-5	5	5
Benzene	71-43-2	5	5
Trans-1,3-dichloropropene	10061-02-6	5	5
Bromoform	75-25-2	5	5
4-Methyl-2-pentanone	108-10-1	10	10
2-Hexanone	591-78-6	10	10
Tetrachloroethene	127-18-4	5	5
Tolene	108-88-3	5	5
1,1,2,2-tetrachloroethane	79-34-5	5	5
Chlorobenzene	108-90-7	5	5
Ethyl benzene	100-41-4	5	5
Styrene	100-42-5	5	5
Xylenes (total)	1330-20-7	5	5

Table A
Contract Laboratory Program
Target Compound List
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
Phenol	108-95-2	10 ug/L	330 ug/Kg
bis(2-Chloroethyl) ether	111-44-4	10	330
2-Chlorophenol	95-57-8	10	330
1,3-Dichlorobenzene	541-73-1	10	330
1,4-Dichlorobenzene	106-46-7	10	330
Benzyl Alcohol	100-51-6	10	330
1,2-Dichlorobenzene	95-50-1	10	330
2-Methylphenol	95-48-7	10	330
bis(2-Chloroisopropyl) ether	108-60-1	10	330
4-Methylphenol	106-44-5	10	330
N-Nitroso-di-n-dipropylamine	621-64-7	10	330
Hexachloroethane	67-72-1	10	330
Nitrobenzene	98-95-3	10	330
Isophorone	78-59-1	10	330
2-Nitrophenol	88-75-5	10	330
2,4-Dimethylphenol	105-67-9	10	330
Benzoic Acid	65-85-0	50	1600
bis(2-Chloroethoxy) methane	111-91-1	10	330
2,4-Dichlorophenol	120-83-2	10	330
1,2,4-Trichlorobenzene	120-82-1	10	330
Naphthalene	91-20-3	10	330
4-Chloroaniline	106-47-8	10	330
Hexachlorobutadiene	87-68-3	10	300
4-Chloro-3-methylphenol	59-50-7	10	330
2-Methylnaphthalene	91-57-6	10	330
Hexachlorocyclopentadiene	77-47-4	10	330
2,4,6-Trichlorophenol	88-06-2	10	330
2,4,5-Trichlorophenol	95-95-4	50	1600
2-Chloronaphthalene	91-58-7	10	330
2-Nitroaniline	88-74-4	50	1600
Dimethylphthalate	131-11-3	10	330
Acenaphthylene	208-96-8	10	330
2,6-Dinitrotoluene	606-20-2	10	330
3-Nitroaniline	99-09-2	50	1600
Acenaphthene	83-32-9	10	330
2,4-Dinitrophenol	51-28-5	50	1600
4-Nitrophenol	100-02-7	50	1600
Dibenzofuran	132-64-9	10	330
2,4-Dinitrotoluene	121-14-2	10	330
Diethylphthalate	84-66-2	10	330
4-Chlorophenyl-phenyl ether	7005-72-3	10	330

Table A
Contract Laboratory Program
Target Compound List
Semivolatiles Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SLUDGE SEDIMENT
Fluorene	86-73-7	10 ug/L	330 ug/Kg
4-Nitroaniline	100-01-6	50	1600
4,6-Dinitro-2-methylphenol	534-52-1	50	1600
N-nitrosodiphenylamine	86-30-6	10	330
4-Bromophenyl-phenylether	101-55-3	10	330
Hexachlorobenzene	118-74-1	10	330
Pentachlorophenol	87-86-5	50	1600
Phenanthrene	85-01-8	10	330
Anthracene	120-12-7	10	330
Di-n-butylphthalate	84-74-2	10	330
Fluoranthene	206-44-0	10	330
Pyrene	129-00-0	10	330
Butylbenzylphthalate	85-68-7	10	330
3,3'-Dichlorobenzidine	91-94-1	20	660
Benzo(a)anthracene	56-55-3	10	330
Chrysene	218-01-9	10	330
bis(2-Ethylhexyl)phthalate	117-81-7	10	330
Di-n-octylphthalate	117-84-0	10	330
Benzo(b)fluoranthene	205-99-2	10	330
Benzo(k)fluoranthene	207-08-9	10	330
Benzo(a)pyrene	50-32-8	10	330
Indeno(1,2,3-cd)pyrene	193-39-5	10	330
Dibenz(a,h)anthracene	53-70-3	10	330
Benzo(g,h,i)perylene	191-24-2	10	330

Table A
Contract Laboratory Program
Target Compound List
Pesticide and PCB Quantitation Limits

COMPOUND	CAS #	WATER	SOIL SEDIMENT SLUDGE
alpha-BHC	319-84-6	0.05 ug/L	8 ug/Kg
beta-BHC	319-85-7	0.05	8
delta-BHC	319-86-8	0.05	8
gamma-BHC (Lindane)	58-89-9	0.05	8
Heptachlor	76-44-8	0.05	8
Aldrin	309-00-2	0.05	8
Heptachlor epoxide	1024-57-3	0.05	8
Endosulfan I	959-98-8	0.05	8
Dieldrin	60-57-1	0.10	16
4,4'-DDE	72-55-9	0.10	16
Endrin	72-20-8	0.10	16
Endosulfan II	33213-65-9	0.10	16
4,4'-DDD	72-54-8	0.10	16
Endosulfan sulfate	1031-07-8	0.10	16
4,4'-DDT	50-29-3	0.10	16
Methoxychlor (Mariate)	72-43-5	0.5	80
Endrin ketone	53494-70-5	0.10	16
alpha-Chlordane	5103-71-9	0.5	80
gamma-chlordane	5103-74-2	0.5	80
Toxaphene	8001-35-2	1.0	160
AROCLOR-1016	12674-11-2	0.5	80
AROCLOR-1221	11104-28-2	0.5	80
AROCLOR-1232	11141-16-5	0.5	80
AROCLOR-1242	53469-21-9	0.5	80
AROCLOR-1248	12672-29-6	0.5	80
AROCLOR-1254	11097-69-1	1.0	160
AROCLOR-1260	11096-82-5	1.0	160

Table A (Cont.)

CONTRACT LABORATORY PROGRAM

TARGET ANALYTE LIST (TAL)

INORGANIC DETECTION LIMITS

Compound	Procedure	Detection Limits Water (µg/L)	Detection Limits Soil Sediment Sludge (mg/kg)
aluminum	ICP	200	40
antimony	furnace	60	2.4
arsenic	furnace	10	2
barium	ICP	200	40
beryllium	ICP	5	1
cadmium	ICP	5	1
calcium	ICP	5,000	1,000
chromium	ICP	10	2
cobalt	ICP	50	10
copper	ICP	25	5
iron	ICP	100	20
lead	furnace	5	1
magnesium	ICP	5,000	1,000
manganese	ICP	15	3
mercury	cold vapor	0.2	0.008
nickel	ICP	40	8
potassium	ICP	5,000	1,000
selenium	furnace	5	1
silver	ICP	10	2
sodium	ICP	5,000	1,000
thallium	furnace	10	2
tin	ICP	40	8
vanadium	ICP	50	10
zinc	ICP	20	4
cyanide	color	10	2

3767:1

APPENDIX E

WELL LOGS OF THE AREA OF THE SITE

Stuntz | 57 | 20 | 8 | nenwsw

David Juntunen

WELL LOG # 1

Star Rt. 2 Box 9
Hibbing, Mn. 55746

Well depth (completed): 52 ft. Date of Completion: 6-7-78

Method: Rotary [X]

Use: Domestic [X]

5. FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
Clay	brown	med.	0	15
clay	gray	med.	15	48
sandy gravel	gray	loose	48	53
clay	gray	hard	53	70

57-20-8 ~~abcd~~ abacdd
el 1441 ± 5'
294-B
A - QBAA

LOCATED BY
1 - [ ] Address Verification
2 - [ ] Name on Mailbox
3 - [ ] Lot-Block
4 - [ ] Plat Book
5 - [X] Info. From Owner
6 - [ ] Info. From Neighbor
7 - [ ] Other
[ ] Can't Locate State Why

RECEIVED
SEP 1 1978

7. CASING: Black [X] Welded [X] Drive Shoe? Yes X
4 in. to 48 ft. Hole diam. 6 in. to 60 ft.

8. SCREEN: Make Johnson; Type stainless steel; Dia. 3"; Slot/Gauze 40; Length 4'; Set between 48 ft. and 52 ft.

9. STATIC WATER LEVEL: 18 ft. below land surface. Date Measured 6-8-78

10. PUMPING LEVEL (below land surface): 22 ft. after 3 hrs. pumping 12 g.p.m.

12. Well grouted? Yes [X]

13. Nearest source of possible contamination: 200 feet nw direction out house type

Well disinfected upon completion? Yes [X]

16. WATER WELL CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

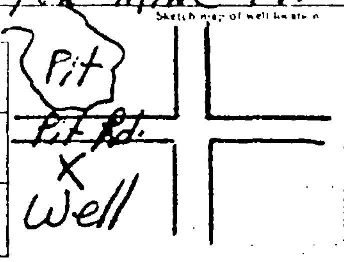
Traut Wells, Inc. License No. 366
Address Hwy 34 E., Park Rapids, Mn. 56470
Signed [signature] Date 8-10-78
Ken Zupan (Name of Driller) Date 8-10-78

MINN. GEOLOGICAL SURVEY COPY

Address City of , WELL LOG # 2

S... ... Scranton Mine Pit

Sketch map of well location



4. WELL DEPTH (completed): 535 ft. Date completed: 12/84

5. ☐ Cable tool ☐ Jetted ☐ Driven ☐ Hollow rod ☐ Air ☐ Bored X Rotary ☐ Power Auger

6. USE
☐ Domestic X Public Supply ☐ Industry ☐ Irrigation ☐ Municipal ☐ Commercial ☐ Test Well ☐ Air Conditioning ☐

3. FORMATION LOG

FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
Rock, Clay, Boulders	Gray		0	18
Coarse, sand, gravel			18	72
Gray clay			72	84
Clay gravel, rock			84	97
Rock			97	110
Blue Clay, Taconite			110	115
Taconite-Broken			115	175
Hard Taconite			175	199
Taconite-Soft-hard	red		199	234
Taconite hard	red dark		234	266
Taconite hard some Soft red ore			266	343
Extra hard black ore			343	470
Gray rock, broken			470	491
Brown rock, gravel loose			491	535

7. CASING
☐ Black ☐ Threaded X Welded
HEIGHT: Above/Below Surface 2 ft.
Drive Shoe? Yes X No

24 in. to 304 ft. Weight Std lbs./ft.
18 in. to 500 ft. Weight Std lbs./ft.
in. to 460 ft. Weight Std lbs./ft.

HOLE DIAM.

8. SCREEN Make N.A.
Or open hole from 460 ft. to 535 ft.
Type / Dia. / Slot/Gauze / Length / Set between ... ft. and ... ft.
FITTINGS:

9. STATIC WATER LEVEL
251 ft. ☐ below ☐ above land surface Date Measured 12-84

10. PUMPING LEVEL (below land surface)
360 ft. after 8 hrs. pumping 1000 g.p.m.
ft. after hrs. pumping g.p.m.

11. WELL HEAD COMPLETION
☐ Pitless adapter ☐ Basement offset X At least 12" above grade

12. Well grouted? X Yes ☐ No Cu. Yds. 35
X Neat Cement ☐ Bentonite
Depth: from 0 ft. to 470 ft.

13. Nearest source of possible contamination ... feet ... direction ... type ?
Well disinfected upon completion? ☐ Yes ☐ No ?

Date 12-84

Layne ... ...

IMPORTANT: FILE WITH DEED (WELL OWNER COPY)

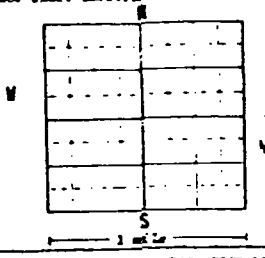
WELL LOG # 3

1. LOCATION OF WELL

County Name	Fraction	Section Number	Township Number	Range Number
St. Louis	NW¼NE¼	26	57 N. or S.	21 N. or W.

Distance and Direction from Road Intersections or Street Address and City of Well Location

Show exact location of well in section grid with "X." Sketch map of well location.



Stuntz - Twp.

3. PROPERTY OWNER'S NAME: Wayne
Address: RR 2
Hibbing, MN 55746

4. WELL DEPTH (completed): 115 ft. Date of Completion: 7-31-79

5. [ ] 1 Cable tool [ ] 4 Reverse [ ] 7 Driven [ ] 10 Dug
[ ] 2 Hollow rod [ ] 5 Air [ ] 8 Bored [ ] 11 _____
[X] 3 Rotary [ ] 6 Jetted [ ] 9 Power Auger

6. USE
[X] 1 Domestic [ ] 4 Public Supply [ ] 7 Industry
[ ] 2 Irrigation [ ] 5 Air Conditioning [ ] 8 Commercial
[ ] 3 Test Well [ ] 6 _____

7. CASING DIAM. Threaded [X] 1 Welded [ ] 2
Black [X] 3 Galv. [ ] 4
4 in. to 96 ft. depth
_____ in. to _____ ft. depth
_____ in. to _____ ft. depth
HEIGHT: Above/Below Surface 1 ft.
Weight 10.89 lbs./ft.
Drive Shoe? Yes ___ No X

8. SCREEN
Make Johnson
Type Stainless Steel Dia. 2"
Slot/Cause .012 Length 16'
Set between 96 ft. and 115 ft.
_____ ft. and _____ ft.
_____ ft. and _____ ft.
Or open hole from _____ ft. to _____ ft.
FITTINGS:

2. FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
Clay	Brown	Soft	0	24
Sand + Gravel	Brown	Soft	24	84
Stratified Bedrock	Gray	Varied	84	100
Med. Coarse Sand & Gravel	Gray	Med	100	116

Use a second sheet, if needed.

9. STATIC WATER LEVEL
52 ft. [X] below [ ] above land surface Date Measured 7-31-79

10. PUMPING LEVEL (below land surface)
70 ft. after 1 hrs. pumping 20-25 g.p.m.
_____ ft. after _____ hrs. pumping _____ g.p.m.

11. WELL HEAD COMPLETION
[ ] 1 Pitless adapter [ ] 2 Basement offset [X] 3 At least 12" above grade

12. Well grouted?
[ ] Yes [X] No Cu. Yds. _____
[ ] 1 Neat cement [ ] 2 Bentonite [ ] 3 _____
Depth: from _____ ft. to _____ ft.
from _____ ft. to _____ ft.

13. Nearest source of possible contamination
10' feet 5 direction Septic type
Well disinfected upon completion? Yes [X] No [ ]

14. PUMP
Date installed _____
[ ] Not installed
Manufacturer's Name _____
Model Number _____ HP _____ Volts _____
Length of drop pipe _____ ft. capacity _____ g.p.m.
Material of drop pipe _____
Type: [ ] 1 Submersible [ ] 3 L.S. Turbine [ ] 5 Reciprocating
[ ] 2 Jet [ ] 4 Centrifugal [ ] 6 _____

15. REMARKS, ELEVATION, SOURCE OF DATA, etc.

16. WATER WELL CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NORTH STAR DRILLING INC 48038
Licensee Business Name License No.

Address Box 93 Isle, MN

Signed _____ Date 8/16/79
Authorized Representative

Don Hensel
Name of Driller

7/74 30M

MINN. GEOLOGICAL SURVEY COPY

WELL LOG # 4

RECEIVED

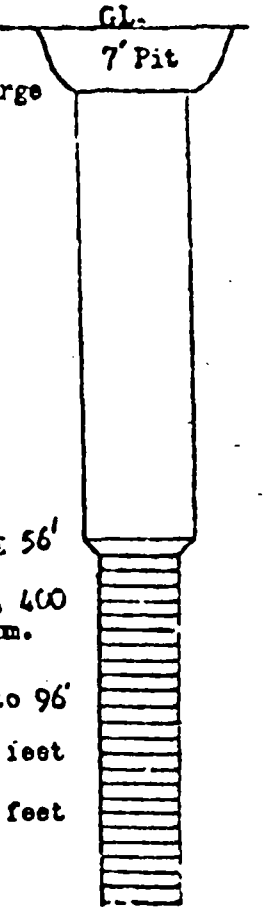
AUG 22 1975

Division of Waters

HIBBING (11B)

Well No. 11B
Elevation 1425 feet
Sea Level Datum

Thickness (ft.)	Depth (ft.)	
	Surface	
7' Pit	7	
8	15	Gray sticky clay
5	20	Brown clay
6	26	Blue clay
14	40	Brown sand, coarse
10	50	Fine gray sand
16	66	Medium sand
4	70	Fine to coarse sand
5	75	Medium to coarse sand
10	85	Fine to coarse sand
15	100	Medium to coarse sand
5	105	Very coarse gravel
5	110	Medium to coarse sand



LOCATED BY

1 - ☐ Address Verification
2 - ☐ Name on Mailbox
3 - ☐ Lot-Block
4 - ☐ Plat Book
5 - ☑ Info. From Owner
6 - ☐ Info. From Neighbor
7 - ☐ Other_____
☐ Can't Locate State Why

57-20-31bbb ACA
elev. 1426±5'
294-B

A-Q BAA

	Thickness (ft.)	Depth (ft.)
[illegible] clay (glacial till)	[illegible]	12
[illegible] clay (glacial till)	[illegible]	35
"[illegible]pan" (glacial till)	13	48
Silt and clay	3	51
Silty fine sand	4	55
Coarse sand	15	70
Fine sand	10	80
Fine to coarse sand	5	85
Silty sand	4	89

Static water level - 45 feet.

Pumping test - 418 gpm. drawdown 25 feet.

Well No. 16 was drilled at this site.

Test Well No. 12 - Elevation 1470 feet mean sea level datum.

Location - NW¼, SW¼, SE¼, Sec.-19, T-57N, R-20W.

Year drilled - 1958.

Contractor - Mead Well Co.

	Thickness (ft.)	Depth (ft.)
Yellow to reddish brown clay (glacial till)	12	12
Blue to gray clay	15	27
Clay and silt, thin lenses of sand and gravel	10	37
Clay, sand and gravel (glacial till)	28	65
Sand and gravel	2	67
Clay and gravel, thin lenses of sand and gravel	103	170

Static water level - 31 feet.

Pumping test - None.